Patricia Morrell

STATE OF MISSOURI

Matt Blunt, Governor • Doyle Childers, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

March 20, 2007

CERTIFIED MAIL – 7001 2510 0005 3345 4725
RETURN RECEIPT REQUESTED

Mr. Curt Gardner
EHS Manager
BASF
Agricultural Division
P.O. Box 817
Hannibal, MO 63401

488086
RCRA

RE: Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (RFI) July 22, 2005, and Phase II RCRA Facility Investigation Report, October 13, 2006
Former American Cyanamid Company, Agricultural Products Division Facility
Hannibal, Missouri
EPA ID# MOD050226075

Dear Mr. Gardner:

The Missouri Department of Natural Resources' Hazardous Waste Program (HWP), in coordination with the U.S. Environmental Protection Agency (EPA), Region VII, has reviewed the *RCRA Facility Investigation Report,* dated July 22, 2005, and the *Phase II RCRA Facility Investigation Report,* dated October 13, 2006, for the Former American Cyanamid Company, Agricultural Products Division Facility in Hannibal, Missouri. The Phase I and Phase II RFIs are well written comprehensive documents that adequately address the majority of objectives for a complete RFI. However, there are a few comments that must be addressed by BASF to meet the RFI requirements of the Hazardous Waste Management Facility Permit before final RFI approval can be granted by the department and EPA. These comments are enclosed with this letter. In lieu of submitting revised reports, BASF can provide the agencies with a letter addressing the enclosed comments, replacement pages to be inserted into the original reports, and a summary table of changes. Please submit the appropriate number of copies as specified in the facility permit.

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The department and EPA request that BASF respond to the enclosed comments within 45 days of receipt of this letter. If you have any questions regarding this letter, please contact me at the Missouri Department of Natural Resources, HWP, P.O. Box 176, Jefferson City, MO 65102-0176, or by phone at (314) 416-2960 Ext. 256.

Sincerely,

HAZARDOUS WASTE PROGRAM

R Bruce Stewart for CKM

Christine Kump-Mitchell, P.E.
Environmental Engineer
Permits Section

CKM:pi

Enclosure

c: Ms. Patricia Murrow, U.S. EPA, Region VII
Mr. John Shonfelt, ARCADIS G&M
Mr. Bob Taggert, Wyeth

GENERAL COMMENTS – PHASE I AND PHASE II

1. Analytical results are screened against the Clean Up Levels for Missouri (CALM) Tier I Soil Target Concentrations (STARCs), Leaching to Groundwater Values (C_{LEACH}), and Groundwater Target Concentrations (GTARCs) during Phase I. Analytical results during Phase II were screened against CALM and Missouri Risk Based Corrective Action (MRBCA) Default Target Levels (DTLs). The United States Environmental Protection Agency (EPA) Region VII recently advised the department that, at this time, it is inappropriate to use the MRBCA guidance for contaminant screening at high priority permitted sites where EPA has the administrative lead (permit or order is under EPA authority). The primary screening of analytical results should include comparison with Region IX Preliminary Remediation Goals (PRGs) for soil and Maximum Contaminant Levels (MCLs) for groundwater. Constituents that do not have PRGs should be compared to Region III Risk Based Concentrations (RBCs); and constituents that do not have groundwater MCLs should be compared to PRGs and RBCs, respectively. The Resource Conservation and Recovery Act Facility Investigation (RFI) shall be modified to include comparison of analytical results to PRGs, MCLs, and RBCs. If screening level values are not available from either Region IX PRGs or Region III RBCs, then screening levels may be derived if toxicity values are available from another source. EPA's risk assessors can assist with deriving screening levels for any constituents detected at the facility that fall into this category. Should BASF decide to conduct a site-specific risk assessment to determine chemical concentrations that are protective of human health and the environment, the risk assessment should be conducted using the most recent version of EPA's Risk Assessment Guidance for Superfund (RAGS).

2. The Phase I and Phase II RFIs should provide, in detail, the rationale for determining the target compound list (TCL). The RFI discusses the raw products used for manufacturing pesticides and herbicides at the facility. These constituents include chlorobenzene, chloroform, 1,2-dichloroethane, methylene chloride, toluene, and naphthalene and were included in the TCL. Review of BASF's June 5, 2003, response to comments indicates that phorate was added to the TCL of Semi-Volatile Organic Compounds (SVOCs). However, the RFI does not include analysis of pesticides and herbicides manufactured at the facility. If these compounds were previously assessed relative to known releases and were determined not to be part of the TCL, then that assessment needs to be discussed. If these compounds were not previously assessed, the RFI should include a detailed discussion explaining why pesticides and herbicides manufactured at the facility were not included on the TCL. If there is no substantive technical basis upon which pest/herb or other compounds were excluded, BASF shall propose how it intends to determine whether these compounds have or have not been released to the environment at levels of regulatory concern. The agencies understand that in some cases there are no standard analytical methods for the chemicals that are handled at the facility. Those cases should be discussed in the RFI.

3. The RFI does not include an evaluation of indoor air. Contaminated soil and groundwater can volatilize into overlying buildings causing Volatile Organic Compounds (VOCs) to be emitted into indoor air. This pathway needs to be addressed and evaluated to determine if contaminated soil and groundwater underlying buildings occupied by plant employees are sufficient to cause unacceptable indoor air concentrations. One method for evaluating indoor air concentrations from soil vapor and groundwater is to run the Johnson and Ettinger (J&E) Model. The J&E Model calculates indoor air concentrations and cancer risks or noncarcinogenic hazard quotients from subsurface soil vapor and groundwater based on site specific input parameters. Site specific input parameters would include existing soil and groundwater data for sampling points located in the vicinity of buildings that are regularly occupied by employees, site-specific soil parameters, building properties, and exposure assumptions. Evaluation of the indoor air pathway is necessary to adequately complete the Human Health Under Control Environmental Indicator Evaluation and the RCRA Facility Investigation.

PHASE I RCRA FACILITY INVESTIGATION REPORT

1. **Plate 3.2, Hydrogeologic Cross Section B-B' Showing Vertical Distribution of VOCs:** The keymap on Plate 3.2 shows cross sections B-B' and C-C', this should be changed to cross sections A-A' and B-B'.

2. **Section 4.2.6, November 2003 Groundwater Sampling Event, Page 29:** This section should reference the Table 4.11 – Summary of Biogeochemical Parameters in Groundwater Samples.

3. **Section 7.3.2.2, "C"Aqueous AST, Page 58; Section 7.3.3.3, Organic Unloading Area, Page 60; Section 7.3.3.3.1, Tank Farm, Page 59; Section 7.3.4.3, Melt Box Area, Page 61, and Section 7.3.5, Lagoons, Page 61:** The text states that soil borings SCB-1, SCB-6, SCB-11, SCB-21, SCB-27, SCB-28, and SBC-32 did not contain any VOC or SVOC concentrations in soil or shallow groundwater. However, Table 4.5 (Summary of VOCs detected in Shallow Groundwater Samples), Table 7.1 (Summary of VOCs Detected in Soil Samples by Mobile GC/MSD), Table 7.2 (Summary of VOCs Detected in Soil Samples), Plate 7.1 (Distribution of Total VOCs and SVOCs in Soil) and Plate 7.2 (Distribution of Total VOCs and SVOCs in Groundwater) show detectable concentrations of VOCs at these locations. Review of the soil analytical results show that acetone was the primary VOC detected in these soil borings and concentrations were below Region IX Preliminary Remediation Goals (PRGs). Chlorobenzene was detected in SCB-32 at concentrations below Region IX PRGs. Review of shallow groundwater results show that chlorobenzene and/or 1,2-dichloroethane were detected in SCB-1, SCB-6, SCB-11, SCB-21, SCB-27, and SCB-28. Chlorobenzene exceeds the MCL of 100 ppb in SCB-11, SCB-21, and SCB-28. 1,2-dichloroethane exceeds the MCL of 5 ppb in SCB-6, SCB-21, SCB-27, and SCB-28. Naphthalene and 2-methylnapthalene were detected in shallow groundwater in SCB-32 at concentrations below Region IX PRGs. The text should be revised accordingly.

4. **Section 11.1.3.1, Potential Current Exposure Pathways, Page 92:** This section states: "Produced groundwater is hard-piped to plant operations requiring water, industrial wells occasionally require sample collection, and the piping that carries the produced groundwater for industrial use occasionally requires repairs. Based on the frequency, dermal contact for Site workers is considered a "de minimus" pathway." This section should discuss whether site workers collecting samples and conducting repairs wear the appropriate level of personal protective equipment.

PHASE II RCRA FACILITY INVESTIGATION REPORT

1. **Section 5.3.2.2, "C"Aqueous AST, Page 41; Section 5.3.3.3.1, Organic Unloading Area, Page 44; Section 5.3.3.3, Tank Farm, Page 45, Section 5.3.4.1, Melt Box Area, Page 47, and Section 5.3.5, Lagoons, Page 48:** The text states that soil borings SCB-1, SCB-6, SCB-11, SCB-21, SCB-27, SCB-28, and SBC-32 did not contain any VOC or SVOC concentrations in soil or shallow groundwater. However, Plate 5.1 (Distribution of Total VOCs and SVOCs in Soil), Table 5.1 (Summary of VOCs Detected in Soil Samples by Mobile GC/MSD), Table 5.2 (Summary of VOCs Analyzed in Soil Samples), and Table 6.1 (Summary of VOCs Detected in Shallow Groundwater Samples) show detectable concentrations of VOCs at these locations. Review of the soil analytical results show that acetone was the primary VOC detected in these soil borings, and concentrations were below Region IX PRGs. Chlorobenzene was detected in SCB-32 at concentrations below Region IX PRGs. Review of shallow groundwater results show that chlorobenzene and/or 1,2-dichloroethane were detected in SCB-1, SCB-6, SCB-11, SCB-21, SCB-27, and SCB-28. Chlorobenzene exceeds the MCL of 100 ppb in SCB-11, SCB-21, and SCB-28. 1,2-dichloroethane exceeds the MCL of 5 ppb in SCB-6, SCB-21, SCB-27, and SCB-28. Naphthalene and 2-methylnapthalene were detected in shallow groundwater in SCB-32 at concentrations below Region IX PRGs. The text should be revised accordingly.

2. **Section 8.3.2, Intermediate (HSU-3) Groundwater Flow Conditions, Page 72, Paragraph 1:** The first sentence states: "groundwater in the intermediate zone (HSU-3) has been observed to only flow away from the Mississippi River towards the south." However the second sentence states: "As displayed in Figures 4.18 through 4.26, groundwater flow in the intermediate groundwater zone during the final seven months of the industrial well test was observed to only flow from the Site towards the Mississippi River." These two statements contradict each other and the second statement contradicts the figures that it references. Review of potentiometric data and Figures 4.18 through 4.26 groundwater in the intermediate zone flows towards the south. This paragraph should be modified accordingly.

3. **Section 9.5, Conceptual Site Fate and Transport Model, Page 89, Third Bullet:** This bullet states that the groundwater flow is generally towards the north but reverses during the high river stage. This was the case during the Phase I RFI, however during the Phase II RFI, drought conditions caused the shallow groundwater flow direction to be primarily to the south. This statement should be modified to reflect effect of drought conditions on direction of groundwater flow in the shallow zone.